



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/659,415

09/10/2003

Greg E. Howard

TI-36081

4622

23494 7590 08/31/2007
TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER

STONER, KILEY SHAWN

ART UNIT

PAPER NUMBER

1725

NOTIFICATION DATE

DELIVERY MODE

08/31/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com
uspto@dlemail.itg.ti.com

Office Action Summary

Application No.

10/659,415

Applicant(s)

HOWARD ET AL.

Examiner

Kiley Stoner

Art Unit

3991

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shalon et al. (US 6,309,891) (hereafter Shalon) in view of Sato (U.S. 4,765,526) (hereafter Sato).

With respect to independent claim 9, Shalon teaches a bonding head having a plurality of wire passages formed therein (col. 6, ll. 35-55); where the capillary tips are capable of having wires disposed through the passages (col. 6, ll. 35-55); and a robot to form a first set of stud bumps outwardly from respective first set of bond pads (col. 6, ll. 34-64). A robot would intrinsically have to control the wire bonding process described in Shalon.

With respect to independent claim 9, Shalon does not explicitly teach a plurality of wire-spools operable to dispense wire through respective ones of the plurality of wire passages.

Sato teaches delivering bonding wire from a plurality of spools through a bonding head with multiple wire passages (Figures 1-2 and col. 3, ll. 6-8).

Art Unit: 1725

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the process of delivering bonding wire from a plurality of spools through a capillary with multiple wire passages as taught by Sato with the wire bonding process of Shalon in order to easily dispense bonding wire through the plurality of passages in the bonding tool of Shalon. Using a spool of bonding wire would allow a great number of bonding operations to be performed before the supply of bonding wire has to be replaced.

With respect dependent claim 11, Shalon is silent with respect to the material of the bonding wire; however, the examiner takes Official Notice that using gold or aluminum wires is well known.

With respect dependent claims 12-13, Shalon does not explicitly teach the pitch between any two adjacent wire passages; however, at the time of the invention it would have been obvious to one of ordinary skill in the art to reduce the pitch between any two adjacent wire passages in order to manufacture smaller chips (see Shalon col. 8, ll. 50-67).

With respect to dependent claims 14-15, Shalon teaches a wire bonding head having a rectangular array (figure 9); that will simultaneously engage (figure 1).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shalon and Sato as applied to claim 9 above, and further in view of US 5,421,503 (Perlberg). Perlberg teaches the bond head is a ceramic (col. 5, ll. 19-35). At the time of the invention it would have been obvious to one of ordinary skill in the art at the time

Art Unit: 1725

of the invention to modify the capillary to utilize a ceramic in order to have a thin wall thickness (see Perlberg col. 5, ll. 15-35).

Claims 9 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fjelstad (US 6,133,072) (hereafter Fjelstad) in view of Sato (U.S. 4,765,526) (hereafter Sato).

With respect to independent claim 9, Fjelstad teaches a bonding head having a plurality of wire passages formed therein (Figure 16; col. 11, ll. 33-38; and col. 15, ll. 49-65); where the capillary tips are capable of having wires disposed through the passages (Figure 16; col. 11, ll. 33-38; and col. 15, ll. 49-65); a substrate having a plurality of bond pads (Figure 16); and a robot to form a first set of stud bumps outwardly from respective first set of bond pads (Figure 16, #232). A robot would intrinsically have to control the wire bonding process described in Fjelstad.

With respect to independent claim 9, Fjelstad does not explicitly teach a plurality of wire-spools operable to dispense wire through respective ones of the plurality of wire passages.

Sato teaches delivering bonding wire from a plurality of spools through a bonding head with multiple wire passages (Figures 1-2 and col. 3, ll. 6-8).

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the process of delivering bonding wire from a plurality of spools through a capillary with multiple wire passages as taught by Sato with the wire bonding process of Fjelstad in order to easily dispense bonding wire through the plurality of

Art Unit: 1725

passages in the bonding tool of Fjelstad. Using a spool of bonding wire would allow a great number of bonding operations to be performed before the supply of bonding wire has to be replaced.

With respect to the pending dependent claims 11-15, Fjelstad also teaches the wires are formed from a material selected from the group consisting of gold and aluminum (abstract and col. 1, ll. 28-30); a pitch between any two adjacent wire passages is no more than 1000 microns (Figure 16 and col. 10, ll. 58-65); wherein a pitch between any two adjacent wire passages is no more than 200 microns (Figure 16 and col. 10, ll. 58-65). Furthermore, at the time of the invention it would have been obvious to one of ordinary skill in the art to reduce the pitch between any two adjacent wire passages in order to manufacture smaller chips. Fjelstad additionally teaches that the wire passages resemble an array selected from the group consisting of a linear array and a rectangular array (Figure 16 and col. 11, ll. 33-38); wherein the robot is operable to simultaneously engage the wires with respective ones of the bond pads to form the stud bumps (Figure 16 and col. 11, ll. 33-38).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fjelstad and Sato as applied to claim 9 above, and further in view of Perlberg (US 5,421,503) (hereafter Perlberg).

Perlberg teaches the bond head is a ceramic (col. 5, ll. 19-35). At the time of the invention it would have been obvious to one of ordinary skill in the art at the time of the

Art Unit: 1725

invention to modify the capillary to utilize a ceramic in order to have a thin wall thickness (see Perlberg col. 5; ll. 15-35).

Response to Arguments

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is 571-272-1183. The examiner can normally be reached Monday-Thursday (9:30 a.m. to 8:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jonathan Johnson can be reached on 571-272-1177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

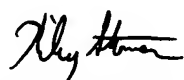
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

Application/Control Number: 10/659,415

Page 7

Art Unit: 1725

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 8/8/07

Kiley Stoner

Primary Examiner A.U. 1725